

## **PSD PRELIMINARY DETERMINATION**

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## 1. EXECUTIVE SUMMARY

Quebecor World Franklin has proposed to expand their existing publication printing plant in Franklin, Kentucky. The expansion will consist of the installation of one new publication rotogravure printing press, one new 33.5 MM Btu/hr natural gas fired boiler with #2 fuel oil as backup, six new tanks, and expansions to the carbon adsorption system. Also, the throughput will increase in one existing tank.

Quebecor World Franklin is an existing major source of volatile organic compounds (VOCs) in which magazines, catalogs, flyers, and newspaper inserts are printed. The proposed new construction/operation will be subject to Regulation 401 KAR 51:017, Prevention of Significant Deterioration (PSD), since the potential VOC emission rate will exceed the applicable significant net emission rate listed in Appendix A to the regulation. The VOC emissions from the affected facilities in the expansion will be approximately 200 tons/yr.

One of the requirements of PSD is compliance with all other applicable air regulations. In addition to PSD, elements of the proposed expansion will be subject to 40 CFR 60 Subpart Dc, 40 CFR 60 Subpart Kb, and 40 CFR 60 Subpart QQ which are incorporated by reference in 401 KAR 60:005, 40 CFR 63 Subpart KK which is incorporated by reference in 401 KAR 63:002, 40 CFR 64, and 401 KAR 59:015. See the Permit Statement of Basis in this package for details.

Additionally, all criteria pollutants with significant potential emissions are subject to the following analyses:

1. An analysis of the air quality impact of the proposed construction on the National Ambient Air Quality Standards and PSD increment allowables;
2. An analysis on the impact on Class 1 Areas;
3. The effect of the proposed construction on soils, vegetation, and visibility;
4. The air quality impact projected for the area due to general commercial, residential, industrial, and other growth associated with the proposed construction; and
5. A demonstration that Best Available Control Technology (BACT) will be employed;
6. The preparation of a Draft Permit available for a 30-day public inspection and comment period, and a public hearing if requested.

VOC emissions (including VOC emissions from the tanks and boiler) from the proposed construction / operation have already been described as significant. The source is accepting synthetic minor permit limits on #2 fuel oil combustion to preclude SO<sub>2</sub> emissions from the above-described analyses. And, no other criteria pollutants will have significant potential emission rates. Therefore, only VOC emissions are subject to the above-described analyses.

This preliminary determination has been incorporated into the Title V draft permit which was previously advertised and commented on. The changes to the Title V permit and this preliminary determination are subject to public review/comment regardless of the previous advertisement and comment and, as a result, the Title V permit has been advertised again with an additional 30 day comment period. This preliminary determination addresses the PSD permitting requirements applicable to the proposed

construction of new affected facilities and changes made to an existing affected facility. The preliminary determination and Title V permit include provisions to meet all regulatory requirements and will be finalized as conditioned unless adverse public comments demonstrate that changes are warranted.

## **2. BACKGROUND AND DESCRIPTION**

Quebecor World Franklin is an existing publication rotogravure printing plant in which magazines, catalogs, flyers, and newspaper inserts are printed. The plant is a major source of VOCs. A PSD application for a permit to construct/operate was received by the Permit Review Branch on September 5, 2000. The application was rolled into the Title V permit application on December 22, 2000. Additional information was received on June 5, 2001, November 21, 2001, December 28, 2001, April 8, 2002, April 26, 2002, May 1, 2002, and May 8, 2002.

This application is for the construction/operation of one new publication rotogravure printing press, one new 33.5 MM Btu/hr natural gas fired boiler with #2 fuel oil as backup, six new tanks, and expansions to the carbon adsorption system. Also, the throughput will increase in one existing tank.

### **Rotogravure Printing Presses**

The rotogravure printing presses at Quebecor World Franklin will be used for publication printing. The gravure printing process uses the intaglio method of printing. In gravure printing, the image areas are recessed relative to the nonimage areas. The gravure cylinder rotates in an ink trough or fountain. Excess ink is removed by a steel doctor blade. The paper is pressed against the cylinder as it turns, by use of a rubber-covered impression roll. When the process is roll-fed, it is known as rotogravure. Rotogravure requires very fluid inks, with solvent contents of 55 percent or higher. The drying is by evaporation of the solvent. In rotogravure, this process may be hastened by passing the printed paper through dryers where solvents are rapidly driven off. Owing to the large amount of highly volatile solvent used in the ink to enhance drying, the ink mixing operation is done frequently and additional solvent is added at the press to maintain the desirable properties of the ink. The emissions from the rotogravure printing presses are VOC (mainly toluene). The rotogravure press proposed for construction at Quebecor will be controlled by a carbon adsorption system.

## **3. EMISSION ANALYSIS**

The VOC emissions from the publication rotogravure printing process are limited to no more than 200 tons/yr in the Title V permit and are assumed to be equal to the VOC consumed in the process minus the VOC recovered by the carbon adsorption system. The emissions are subject to a BACT analysis and the achievable control efficiency determined by the permitting agency, discussed below, considers and includes solvent retained in the paper and emitted off of the press. Compliance with emission standards will be demonstrated monthly since shorter limits may not be representative. With carbon adsorption, nearly all of the VOC is recovered until breakthrough is approached. Therefore, traditional test methods are mostly unreliable indicators of compliance. By using month long material balances, it is generally believed that accuracy is not greatly affected by the measurement point in the adsorption cycle and that compliance demonstration is representative.

The VOC emissions from the tanks are subject to a BACT analysis and were calculated using Tanks 4.0. Potentially, about 2 tons of VOC emissions are likely from the tanks. However, the source reconciles materials applied, and in reality the division believes that the tank emissions are counted in the liquid-liquid material balance used by the source. As discussed below, no control is required for BACT on the tanks.

The emissions from the boiler are calculated using emission factors found in AP-42 Chapters 1.4 and 1.3. Since synthetic minor limits have been accepted for SO<sub>2</sub> emissions, only the VOC emissions are subject to a BACT analysis. However, the VOC emissions are low (< 0.1 tons/yr). As discussed below, no control is required for BACT on the boiler.

#### **4. REGULATION AND AIR QUALITY ANALYSIS**

##### **A. Compliance with National Ambient Air Quality Standards**

The proposed expansion will emit approximately 200 tons/year of VOC. The magnitude and locations of ambient concentrations due to the proposed expansion were not determined because there is neither an atmospheric dispersion model available to predict ozone concentrations nor is there a National Ambient Air Quality Standard (NAAQS) or a PSD increment for VOC. Simpson County is currently designated attainment for ozone. Emissions of PM, SO<sub>2</sub>, and NO<sub>x</sub> will not exceed the PSD significant levels and therefore will not have to go through PSD review.

The Division for Air Quality operates an ambient ozone monitor in Franklin at the State Highway Garage on Kentucky Highway 1008. A summary of the data from this monitor is contained in the application and indicates compliance with the ambient ozone standard in this area. The data satisfies the preconstruction monitoring requirement. The state will continue to monitor ozone levels in the future at the Franklin site, therefore, post construction monitoring by Quebecor World Franklin will not be required as a condition of approval in the permit.

##### **B. Impact on Class 1 Areas**

The nearest Class 1 area to the proposed source is Mammoth Cave National Park, located approximately 75 kilometers northeast of the plant. The impact of ozone resulting from the increase in VOC emissions from Quebecor World Franklin cannot be predicted due to the non-availability of appropriate air modeling for ozone.

##### **C. Additional Impact Analysis**

The analysis made by the applicant of the impact the proposed VOC emissions from the expansion would have on visibility, soils and vegetation, and growth are contained in the application. This analysis demonstrates that no adverse effects are expected.

##### **D. Stack Height Analysis**

A stack height analysis is not required since all stacks will be less than 65 meters in height. Therefore, the company will comply with the requirement for Good Engineering Practice (GEP) in the federal definition of GEP found in 40 CFR 51.1 and 401 KAR 50:042.

**E. Regulation Discussion**

See the Permit Statement of Basis in this package for details.

**5. BEST AVAILABLE CONTROL TECHNOLOGY REVIEW AND ECONOMIC ANALYSIS**

Quebecor World Franklin is proposing to construct/operate a major modification to an existing major source. Therefore, Quebecor World Franklin is required to demonstrate that Best Available Control Technology (BACT) will be employed to control the VOC emissions from the new affected facilities. BACT is defined as an emission limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under 42 USC 7401 to 7671q (Clean Air Act), which would be emitted from a proposed major stationary source or major modification which the cabinet, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for that source or modification through application of production processes or available methods, systems, and techniques.

For the major modification, Quebecor World Franklin is proposing the following BACT requirements.

1. Press 6 shall be constructed and operated in a permanent total enclosure.
2. Carbon adsorption shall be used to recover the VOC emissions.
3. Overall VOC control efficiency shall be 95% by weight.
4. Tanks associated with operation of Press 6 or the control device will not be controlled due to the high annual cost for control of only a couple of tons of VOC.
5. And, the proposed boiler will not be controlled since the VOC emissions are essentially being thermally incinerated.

See the permit application for a further information on the source's BACT analysis.

To evaluate the source's proposed BACT, the division has utilized the current U.S. EPA policy of evaluating control possibilities starting at the top and continuing down and determining BACT to be the maximum emission reduction that is technologically and economically achievable considering all relevant factors. As a result of the evaluation, the division concurs with all of the source's BACT proposal except the overall VOC control efficiency. The division is aware of a similar press at Quebecor that is required to achieve 96% overall VOC control efficiency. Therefore, BACT for the proposed PSD application submitted by Quebecor will include a permit requirement for 96% overall VOC control, by weight.

The division understands that other sources demonstrating 98% control are losing some VOC in the paper and because of this factor the demonstrations are essentially not comparable. Therefore, the division believes it is reasonable to assume that an actual comparable control efficiency would be 95 to 96% based on AP-42 estimates for VOC remaining in the paper and the best demonstrated control device efficiencies. Given this reasoning, one does not have to look any further than the permit requirements for a similar press (Press 4) that is currently operating at Quebecor World Franklin to establish BACT. Press 4 has a permit requirement for 96% control efficiency. Based on the division's review, 96% overall VOC control efficiency, by weight, is achievable considering all relevant factors.

This evaluation is further supported by data on file at the division for the source. Since Press 4 is part of a common control system with other presses that are not within permanent total enclosures, it was difficult to determine the control efficiency demonstrated by Press 4. However, using a calculation similar to the one described in the Title V draft permit for Press 6 and the Press 4 excluded demonstrated control efficiency of 92.8%, there is enough data to support an assumption that Press 4 demonstrated 96% overall control efficiency at startup in 1992. Furthermore, when VOC application rates on Press 4 were increased in late 1994 or early 1995 (to the same application rate allowed on Press 6), the source's demonstrated control efficiency did not drop (as a matter of record, control efficiency at the source, including 3 presses not within a permanent total enclosure, exceeded 96% during some months). Based on the available data, another similar press at Quebecor (Press 5) also demonstrated an overall control efficiency exceeding 96% following construction of the press in 1995.

The source has also asserted that as ink application increases, VOC retention in the paper will also increase. The data examined from 1994 and 1995 on file at the division for Presses 4 and 5 does not support this. In short, the division has invested considerable time and effort to demonstrate that an overall control efficiency of 96% is achievable and should be part of the minimum BACT requirements acceptable for Press 6. The Title V draft permit has therefore been so conditioned.

## **6. DISCUSSION, CONCLUSION, AND RECOMMENDATION**

Approval of the PSD application is contingent upon compliance with Regulations 401 KAR 51:017, 401 KAR 59:015, 401 KAR 60:005, and 401 KAR 63:002. This review demonstrates that the proposed new construction/operation with 96% overall VOC control efficiency will comply with the PSD regulation requirements and all applicable SIP, NSPS, and MACT emissions standards. Additionally, the increase in VOC emissions is not expected to adversely affect the ozone attainment status in the region.

The Permit Reviewer Branch of the Division for Air Quality recommends issuance of this preliminary determination and the attached draft Title V construction/operation permit to Quebecor World Franklin. The previously issued Title V draft permit for the source will not be addressed further since the new attached Title V draft permit will be advertised and the public will again have 30 days to comment. Unless adverse public comments demonstrate that additional changes are warranted, the draft permit should be finalized subsequent to the public review period.